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THE PLANT DISEASE REPORTER

Issued By

THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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THE PLANT DISEASE SURVEY
DIVISION OF MYCOLOGY AND DISEASE SURVEY

Plant Industry Station — Beltsville, Maryland
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A SUMMARY OF CUCURBIT DOWNY MILDEW REPORTS FROM ATLANTIC COASTAL STATES IN 1947

C. J. Nusbaum

For the seventh consecutive season a cooperative reporting service on cucurbit downy mildew [Pseudoperonospora cubensis] in the Atlantic coastal areas was conducted with the view of furthering the development of an organized forecasting system for this disease. Cooperating pathologists in nine States from Florida to Massachussetts submitted a total of 26 timely reports upon the establishment and spread of downy mildew in relation to the development of cucurbit crops and the climatic conditions in their respective localities. These reports were assembled by the writer and copies were sent to each collaborator in order to disseminate information on the progressively northward spread of the disease, thus affording a means of anticipating the time of its appearance and probable severity in cucurbit producing areas. A summary and brief analysis of the 1947 reports follows:

Florida. - Downy mildew was present on cucumbers in the Webster, Center Hill and Mascotte area throughout March. By April 10 damage was fairly heavy but somewhat spotty. A wet, humid period in mid-April with minimum temperatures in the 60's favored sporulation and spread but by April 18 there was still no infection on watermelons at Leesburg. Cool weather with scattered showers on May 8 was attended by heavy sporulation. By May 12, downy mildew was abundant on watermelons. - G. K. Parris.

Georgia. - In southern Georgia downy mildew did not appear until after rains on May 21 and 22. The disease was first found on cucumbers on May 25 at Tifton and at some other points in the southern and southeastern parts of the State. There were frequent showers the latter part of May and downy mildew spread rapidly on cucumbers but it was not found on either cantaloupes or watermelons. There was practically no spread of the disease from June 1 to 18. The weather during this period was hot and dry. No further observations were made. - E. K. Vaughan

South Carolina (Charleston). - The disease probably became established in this area early in May or at about the same time as in 1946. On May 12 primary lesions surrounded by incipient secondary infections were found on a few plants in one cucumber field. Development of the disease was restricted after its establishment by hot, dry weather. - W. M. Epps.

(Blackville) - Downy mildew became established in this section at about the same time that it took place at Tifton, Georgia. The May drouth was broken about May 20 and the first primary infection was found on cucumbers on May 26. There were scattered showers from then until June 1 and a small amount of secondary infection developed. The first part of June however, was dry and hot and sporulation ceased until the advent of showers on June 10. At that time there were scattered focal points of infection in most cucumber fields but damage was slight and both cantaloupes and watermelons remained free of mildew infection. Numerous showers, moderate temperatures and heavy dews during the last two weeks in June afforded ideal conditions for the development of the disease. By June 22 cucumbers were destroyed and cantaloupes were heavily infected. By July 1 cantaloupes showed about 60 percent defoliation, with complete collapse following a few days later. Cucumbers largely escaped damage but the cantaloupe crop suffered severely. This loss was lessened, however, by a sudden break in the market about June 28. From June 20 to about July 4, sporulation was very heavy every night. Downy mildew first appeared on watermelons the first week in July and was of no economic importance. - C. J. Nusbaum

North Carolina. - A prolonged drouth was broken over most of the State on May 22 to 24 and for the next two or three weeks the weather was generally favorable for infection. Scattered primary and secondary infection was found at Laurinburg on June 5 so the disease was probably established at about the same time that it appeared at Blackville, South Carolina. On June 6 both primary and secondary lesions were observed near Wilmington and primary infection was found in one field in Pender County. Except for a drouth area in the south-central portion, weather conditions were generally favorable for downy mildew throughout the month of June. In the southeastern part of the State at Wilmington cucumbers were severely defoliated by June 20 and by June 26 some defoliation was evident as far north as Greenville. Early secondary infection was observed in Northhampton and Warren Counties, near the Virginia border, on June 27. The disease in general was widespread and destructive. - D. E. Ellis.

Virginia (Norfolk) - Widely scattered primary infections were found on cucumbers in the vicinity of Norfolk on July 3. The lesions were sporulating. No mildew was found on cantaloupes or watermelons on this date. On July 15 scattered infection centers were found in one field of cantaloupes. Observations in several other cantaloupe fields on July 16 showed either an occasional lesion or no mildew. - T. J. Nugent.

(Blacksburg). - Downy mildew was found in one field of cucumbers in Pittsylvania County on July 17. The infection appeared to be at least one week old indicating that the disease became established

there prior to July 10. A visit to James City County in Eastern Virginia on August 30 revealed that downy mildew had completely defoliated cantaloupes and caused severe injury to watermelons. It was estimated that the cucumber season was shortened two or three weeks by downy mildew. - S. B. Fenne.

Maryland - Downy mildew was observed in a field of cantaloupes near Salisbury on July 10. - Carroll Cox.

Delaware - Twenty fields of cucumbers were visited on July 10. One field at Gumboro in lower Delaware showed scattered, primary infections. A statewide survey of cucumbers and cantaloupes was made on July 16. All of the 25 cucumber fields showed primary infection and there was considerable secondary spread in the Gumboro locality where the disease was first found about a week earlier. Weather conditions in mid-July were judged favorable for infection. The fungus was sporulating abundantly in all fields.

Light, scattered infection was found in all of the fifteen cantaloupe fields inspected. Sporulation was unusually heavy.

Mildew was of no economic importance on cucumbers because a market collapse at the peak of harvest in mid-July caused the abandonment of many fields. More growers were using fungicides on cantaloupes than in previous years. - J. W. Heuberger.

Pennsylvania. - Downy mildew first appeared in a field of cucumbers in Armstrong County about August 19. Other fields in Armstrong, Butler, Bedford, and Blair Counties showed from 75 to 100 percent infection by the last of August. Moderate infection was found in one field of muskmelons in Butler County on August 27 and in two Bedford County fields on August 28. Subsequently, one of the most severe outbreaks on record developed. Mildew was found in all sections of the State on cucumber, cantaloupe, squash, pumpkin, and wild cucumber, but losses were most severe in the central part on cucumber and cantaloupe. - R. S. Kirby

New York (Long Island) - Downy mildew was found at Riverhead in one field of cucumbers on July 31. This was primary infection and was sporulating freely. Cantaloupes on the same farm showed no infection at that time. For a ten-day period prior to this, rains on July 20, 22, 23, and 28, moderate to cool temperatures and high humidities generally favored the establishment of the disease.

A comprehensive survey of cucumber fields in eastern Long Island was made on August 5. Mildew was present in all fields

examined except in some late plantings in the Orient area where the plants were very young. In most of the early plantings inspected infection was heavy and in a few cases the plants were nearly finished. Because of market conditions most early plantings were being abandoned. - H. S. Cunningham.

(Ithaca). - By August 26 downy mildew was prevalent on muskmelons in gardens about Ithaca. By September 5 the disease was prevalent over the entire State, a most unusual situation since there had been only four reports of occurrence of cucurbit downy mildew in upState New York in the past 35 years and in each of those cases only one field was infected at that time. - Charles Chupp.

Connecticut. - A few cucurbit fields were observed in the Connecticut Valley about August 10. No mildew was found. By August 25 the disease was becoming destructive in fields along the shore of Long Island Sound. - J. G. Horsfall.

Note: In mid-August W. C. Barnes of the South Carolina Truck Experiment Station, Charleston, South Carolina, observed some cucumber trials at Milford, Connecticut. He reported that some of his downy mildew-resistant lines were standing up well whereas standard varieties were going down with mildew even though they had been dusted with a copper fungicide.

Massachusetts. - Several cucumber fields were examined on July 22 in Bristol County where mildew usually appears first in this State. None was found. However, late blight of potato and tomato were just getting started. A two-day rainy spell on July 22 and 23 ended a prolonged hot, dry period. At that time it was supposed that downy mildew would soon make its appearance in view of the heavy sporulation of the fungus to the south in Delaware and the advent of more favorable conditions for infection in Massachusetts.

On August 4 a few primary centers with slight secondary spread were found in two fields in Bristol County. One field had been dusted, the other not treated. On August 5 one primary center with a little secondary spread was found in a cucumber field in Plymouth County. On August 7 several centers with considerable secondary spread were found in Hampden County. Neither field had been treated. From the stage of advancement of the disease in these localities it was judged that the infection had become established during the wet spell of July 22 and 23, mentioned above. On August 11, the disease was just getting started in cucumber pickle fields in Hampshire and Franklin Counties, representing later beginnings than the infection observed in Bristol, Plymouth and Hampden Counties.

Mid-August was hot and dry. By August 22, however, the cucumber fields in Hampshire and Franklin Counties were almost completely killed and mildew was being established on unprotected muskmelon and squash. - O. C. Boyd.

As in 1945 and 1946, the 1947 season was characterized by the early establishment of cucurbit downy mildew in producing areas all along the Atlantic Seaboard. Furthermore, the disease appeared to spread inland more than usual, especially in Virginia, Pennsylvania, and upper New York. For the most part mildew caused considerable damage, although the economic losses it caused in some areas was minimized by a break in the market before the disease became serious. This appeared to be the case with cantaloupes in South Carolina and with cucumbers in Delaware and Long Island. Moreover, in some cases, the bulk of the crop was harvested before the disease became very serious. The cucumber and watermelon crops at Blackville, South Carolina fall in this category.

The reporting service in 1947 showed some improvement over previous years. More workers were participating and a greater number of reports were received. It enabled at least three reporting stations, Blackville, South Carolina, Delaware, and Massachusetts, and possibly others, to anticipate the time of arrival of downy mildew accurately. Delaware, and perhaps other States, distributed mimeographed warning circulars prior to the arrival of the disease. However, there is still room for improvement, especially in the matter of correlating the spread and development of the disease with both local and regional weather conditions, more detailed reporting of weather conditions, and the possible development of a better method of keeping in closer touch with sporulation. The writer wishes to take this opportunity to thank all of those who participated in the program this year.

EDISTO EXPERIMENT STATION, BLACKVILLE, SOUTH CAROLINA

FUSARIUM WILT OF FALL TOMATOES IN MISSISSIPPI

Douglas C. Bain

This is to report an interesting situation that occurred during and after the hurricane that swept the Gulf Coast on September 18 - 19, 1947.

Nearly 4000 tomato plants of different lines and varieties were set out at the Truck Crops Experiment Station about August 10. These were planted in rows varying from 25 to 200 feet in length, one variety or

line following another. The plants had been irrigated once, and were staked and pruned to two main stalks. A considerable number had set fruit on the second and third clusters by September 10. Prior to the storm, the weather had been rather hot and dry. No Fusarium wilt had shown up except in several plants of the susceptible variety Gulf State Market. There was no bacterial wilt in any of the plants.

Although the Crystal Springs area was not in the path of the storm, it did have gusts of wind approaching 60 m.p.h., and heavy rainfall. On Thursday, September 18, there was a steady wind all day, probably around 15-20 m.p.h. The sky was clear most of the day but toward evening it began to cloud up. Friday was cloudy and rainy with a steady wind accompanied by gusts approaching 30 or more m.p.h. During the day, several of the tomato plants were blown over and many of the others were leaning considerably. Toward evening, the wind velocity and rainfall increased. Around midnight Friday, we had our heaviest gusts of wind (Jackson reported gusts of 55 m.p.h. but apparently they were stronger here as evidenced by greater damage to trees, etc.). The rainfall during the night was approximately 3 inches. By Saturday morning, all the tomato plants had been blown down and many were lying in water in the middles. Saturday was mostly clear with slight wind. Sunday (September 21) morning there was a short shower, but the rest of the day was clear and warm.

The task of straightening up the tomato plants and tying them again was started Monday, even though the middles were wet and muddy. It was then noted that some of the plants had wilted, and it was assumed that this was perhaps due to water-logging. The wilting had been sudden and complete and appeared to show up first at the tips of the branches. The next day, however, closer examination of the wilted plants showed vascular discoloration as high as one-third up the stem. The symptoms were not suggestive of bacterial wilt. There was no apparent relation between wilted plants and poor drainage (usually at the ends of the rows) or between wilted plants that had lain a day or two in water in the middles and those that had not. On September 24, counts were made of plants of all the different lines and varieties and the percentage of wilted plants was determined. The percentages of wilted plants in the four commercial varieties are given in Table I. Among the 47 lines and selections, the percentage of wilted plants varied from 0 (one with 46 plants and the other two with 4 and 5 plants) to 90. These data are not recorded here because the wilt reaction is not known at the present time and thus would be of no particular interest. A small percentage of wilted plants in most of the lines and varieties recovered later and some apparently dead ones produced axillary shoots below the dead distal portion of the stem.

Microscopic examinations of free-hand sections of stems of wilted plants revealed the presence of fungous hyphae in the vessels. No

Table I. Percentage of wilted plants of 4 commercial varieties. Wilt present only in Gulf State Market prior to storm, but these plants were not counted.

Variety	Total no. plants	No. plants wilted	Percent wilted
Marglobe	204	82	40.0
Rutgers	194	33	17.0
Pan America	188	39	20.7
Gulf State	174	38	21.8

bacteria could be seen, however. About 200 bits of tissue, taken from stems 4-15 cm. above the soil level, were plated on potato-dextrose and oatmeal agars. This material was selected from wilted plants of the variety Pan America. A few colonies of Fusarium were isolated in culture from portions of stem tissue closest to the ground. Cultural characteristics of the fungus resembled those of the wilt organism. Since these isolates appeared to be the same in culture, only one was selected for inoculation tests. Several young plants of Rutgers and Gulf State Market varieties were inoculated according to a modification of Wellman's[1] technique. Symptoms of wilt began to appear in the inoculated plants about 8 days after inoculation. At the end of 2 weeks a small percentage of inoculated plants of both varieties showed typical wilt. Inoculated check plants remained healthy. Fusarium was readily isolated from these plants. Tests were again run with the same varieties of tomatoes but with 3 separate isolates of the fungus: (#1) one used in routine testing for resistance, (#2) the one used in the inoculations described above, and (#3) an isolate from wilted plants of the first inoculation test. Wilt was again obtained but the rate of appearance of symptoms varied with the isolates. Plants inoculated with isolate #1 showed wilt first, those inoculated with #3 a day later, and plants inoculated with #2 wilted the following day.

The fact that the vascular system of the wilted plants was discolored upwards several inches indicated that the plants had been infected prior to the storm but not to a degree of wilting. Various conditions that accompanied the storm, however, apparently predisposed the plants to sudden wilting.

MISSISSIPPI TRUCK CROPS EXPERIMENT STATION, CRYSTAL SPRINGS

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[1] Wellman, Frederick L. A technique for studying host resistance and pathogenicity in tomato Fusarium wilt. Phytopathology 29: 945-956. 1939.

STEMPHYLIUM SOLANI ON TOMATOES IN INDIANA

R. W. Samson

So far as we are aware, the occurrence of gray leaf spot (Stemphylium solani Weber) on tomatoes in Indiana has not been previously reported, although we have observed it in the State during at least the past twelve years. Outbreaks of the disease in Indiana canning tomato fields were particularly conspicuous and severe in August and September, 1947.

The disease was identified last spring on in-coming tomato seedlings or transplants received from southern Georgia. This is the first time we have noted it on such seedlings, but undoubtedly it is almost annually introduced into the northern tomato canning tomato areas in this way. We doubt, however, if the occurrence of the disease in Indiana is wholly dependent upon this possible source.

This past season, instances were noted of severe gray leafspot in parts of fields set with Georgia-grown plants, with much less of the disease in the remainders of the fields set with plants from other sources.

However, the most severe cases noted were in fields established by sowing the seed directly in them. These instances were associated with factors promoting prolonged high humidities during the high temperatures of August.

The occurrence of the disease in Indiana tomato fields in 1947 and in previous seasons has not been entirely restricted to such locally favored sites, but has been repeatedly observed rather generally throughout the southern two-thirds of the State.

The disease attracted the attention of Indiana canners and fieldmen in 1947 because of the apparent very sudden development, the lesions appearing with almost equal and simultaneous abundance on the tip-most leaves and on the lower leaves. We have not attempted to estimate the general damage caused by it, since its effects are difficult to separate from those of Septoria leafspot and early blight. In local instances, the severe defoliation from Stemphylium probably reduced yields by 40 percent or more.

We are indebted to Dr. George F. Weber for confirming our identification of the disease before putting its occurrence in Indiana on record.

PURDUE UNIVERSITY AGRICULTURAL EXPERIMENT STATION, LAFAYETTE, INDIANA

TOMATO RUSSET MITE IN NORTH DAKOTA

Wm. G. Hoyman and R. L. Post

The tomato russet mite, Phyllocoptes destructor Keifer[3] was described from specimens found on tomatoes in a Modesto, California greenhouse in 1940. A report by Bailey and Keifer[1] indicated that this pest was becoming a serious problem in northern California. During the Emergency Plant Disease Prevention Project, Hoyman[2] reported the presence of the mite in a tomato planting in the Salt River Valley of Arizona, December 1943. Infested tomato plantings were observed at various locations in the Salt River Valley and in several Tucson, Arizona victory gardens during 1944. The mite was also found in the Plant Pathology greenhouse at Arizona University.

At the request of Mr. Harold Mattson, Horticulturist of the North Dakota Agricultural Experiment Station, tomatoes growing in the Horticultural greenhouse at Fargo, North Dakota, were examined December 1, 1947. The browning and curling of the leaves on some plants resembled the symptoms common to tomatoes infested with the tomato russet mite and further examination indicated their presence.

According to Mr. Mattson, most of the tomato plants were grown from locally-produced seed. The two packets of commercial seed used were two and three years old. A few thousand potato and wheat seedlings were grown from seed and located in other sections of the greenhouse. Several ornamentals had been moved to the greenhouse from the nearby horticultural plots during September and one tomato plant was brought from St. Cloud, Minnesota. From casual observations of the horticultural and other tomato plantings at Fargo during 1947, no plants were noticed having symptoms similar to those produced by the tomato russet mite.

NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION AND STATE SEED DEPARTMENT

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1 Bailey, S. F. and Keifer, H. H. The tomato russet mite, Phyllocoptes destructor Keifer: Its present status. Jour. Econ. Entomol. 36: 706-712. 1943.

2 Hoyman, William G. Damage from the tomato russet mite in Arizona. U. S. Dept. Agr. Plant Dis. Reptr. 28: 762. 1944.

3 Keifer, H. H. Eriophyid studies X. Bull. Calif. State Dept. Agr. 29: 160-179. 1940.

RESULTS OF DISEASE-CONTROL PRACTICES FOLLOWED BY TEN-TON TOMATO GROWERS IN 1947

R. S. Kirby

Of the 442 Ten-Ton Tomato Growers who turned in complete spray, yield, and grade records only eight or less than 2 percent grew ten tons without spraying or dusting.

As the number of spray or dust applications increased the average yield also increased.

Summary of disease control practices of Ten-Ton Tomato Growers in 1947

Number applications of sprays and dusts	Number of growers	Yield in tons per acre	Percentage of No. 1 tomatoes
None	8	10.7	66.2
1 to 4 (average 3.3)	162	12.3	71.9
5	127	13.3	74.3
6 to 9 (average 6.4)	145	14.2	75.5

Growers applying 1 to 4 applications (average of 3.3) obtained 1.6 more tons per acre than unsprayed. Five applications yielded 1 ton per acre more than the average of 3.3 applications. Six to 9 (average of 6.4) applications gave 0.9 tons per acre more than unsprayed.

As the number of spray and dust applications increased, the average percentage of No. 1 tomatoes increased. It seems likely that the 66.2 percent of No. 1 fruit came from 8 fields unusually free of disease. In Dr. W. S. Beach's spray plots at Hershey and at State College, unsprayed tomatoes yielded less than 34 percent No. 1 tomatoes as compared with 78 percent No. 1 tomatoes in plots receiving 5 to 6 Zerlate-Copper sprays.

Incrasing the average number of applications from 3.3 to 5 increased the percentage of No. 1 tomatoes by 2.3. Increasing applications from 5 to 6.4 gave 1.2 percent more No. 1 tomatoes. Growers applying 5 applications (usual number of applications recommended) had 8.1 percent more No. 1 tomatoes than Ten-Ton Growers who did not spray or dust. Of the 434 growers who sprayed or dusted, 306 or 71 percent sprayed, 5 percent applied both spray and dusts, and 24 percent dusted.

Of the growers who sprayed, 287 or 66.1 per cent used row crop sprayers and 19 or 4.3 percent used orchard guns. Fifty-six percent applied Zerlate or Karbam and additional sprays of Fixed Copper or Bordeaux, and 14.5 percent applied Fixed Copper or Bordeaux. Of the 106 growers who dusted, 86 had dust applied with aeroplanes and 20 applied the dust with row crop dusters.

In order to obtain the fairest comparison of methods and materials only the results of those growers were considered who applied 4, 5, or 6 applications of spray or dust. Of the 320 growers who made 4 to 6 applications, those that sprayed had an average of 0.4 tons per acre more tomatoes than those who dusted and those that sprayed averaged 2 percent more No. 1 tomatoes than those who dusted. Growers spraying with Zerlate or Karbam and copper had an average of 0.1 tons more per acre and 0.6 per cent more No. 1 tomatoes than the growers using only fixed copper or Bordeaux. The 204 growers who used row crop sprayers had 0.1 tons per acre more tomatoes and 4.5 per cent more No. 1 tomatoes than the 17 growers who used orchard guns.

PENNSYLVANIA STATE COLLEGE, STATE COLLEGE

1947 RESULTS OF LATE BLIGHT FORECASTING IN EASTERN VIRGINIA[1]

Harold T. Cook

The potato and tomato growers in Eastern Virginia saved up to $2,000,000 by not spraying or dusting for late blight [*Phytophthora infestans*] in 1947. It was possible for them to avoid the expense of needless spraying or dusting with reasonable safety because the late blight forecasts issued by the Plant Pathology Department of the Virginia Truck Experiment Station showed the weather was unfavorable for development of the disease.

The late blight forecasts were based on the forecasting method described in April 1947 issue of the FOOD PACKER (also PDR 31(6): 245-249. June 15, 1947). The method was developed from a study of the occurrence of late blight in relation to the rainfall and temperature during the last seventeen years. It was put to a practical test for the first time in 1947.

Four forecasts were issued at weekly intervals beginning on May 15th. All of the forecasts stated that the weather was unfavorable for late blight and the last two advised the growers that the disease was unlikely to be important in 1947.

The forecasts proved to be correct. There was no general outbreak of late blight in Eastern Virginia and over 90 percent of the potato and

[1] Reprinted from December 1947, FOOD PACKER.

tomato acreage was entirely free of the disease. A trace of blight did occur on potatoes in a few fields in Princess Anne County late in June when the potatoes were being harvested, but it caused no reduction in yield or tuber rot. A somewhat more serious outbreak of blight occurred in a narrow belt across the northern end of the Eastern Shore the last week in July. However, even in this area, the disease had disappeared entirely by the second week in August and the total damage to the tomato crop amounted to less than 3 percent.

The chart by which the forecasts were made is shown in figure 1. A similar chart for 1946 when blight was destructive is shown in figure 2 for comparison.

The charts start on May 8th which is the beginning of the critical period when the blight epidemics began in 1938 and 1946. In interpreting these charts, the weather is considered favorable for blight if the rainfall line is above the critical rainfall line and the mean temperature is less than the critical temperature (75° F). The weather must remain continuously favorable for blight for about two weeks before there is danger of the disease developing to a serious degree.

A comparison of the charts shows that the rainfall in the two seasons was very different. The temperature in 1946 was somewhat lower than in 1947 and the rainfall line for 1947 was continuously below the critical line while in 1946 it was above after the first six days.

The first forecast was issued on May 15th. The 1947 chart shows that there was no rain during the first week of the critical period. The critical rainfall line indicates that more than 1.2 inches would be required to be favorable for blight. In 1946, when blight was serious, there was 1.75 inches of rain during the first week. The five day weather forecast indicated not more than 0.5 inches of rain by the 19th so it was very unlikely that blight would develop soon.

The second forecast was issued May 22nd. The 1947 chart shows that only 0.6 inches of rain had fallen up to that date. This was 1.7 inches below the critical line and 3.5 inches less than in 1946. The five day forecast indicated only about 1.4 inches by the 26th. Even with that amount, the rainfall line would have been 1 inch below the critical line.

The third forecast was relaeased on May 29th. The 1947 chart shows only 0.99 inches of rain during the three weeks and the rainfall line was 2.5 inches below the critical line. There was 5.55 inches of rain during the same period in 1946. At this time, the growers were advised that it was very unlikely the disease would be important as the first three weeks of the critical period had been unfavorable.

The fourth forecast was made on June 5th. The rainfall up to that date had only been 1.15 inches which was 3.55 inches below the critical

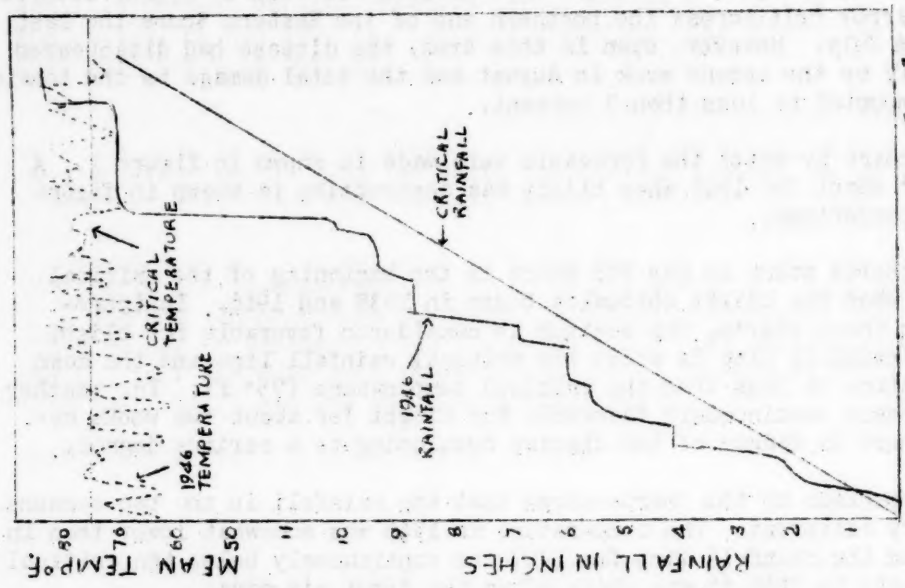

Figure 2 - 1946

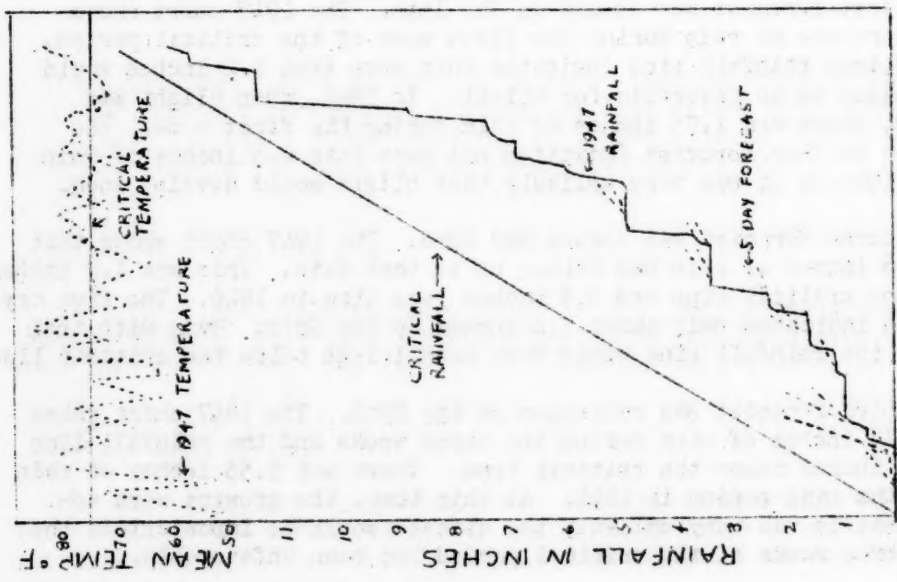

Figure 1 - 1947

Late blight forecasting chart--Norfolk, Virginia

line. There was over five times as much rain during the same period in 1946. The growers were again advised that the weather was unfavorable for blight and that it was very unlikely the disease would be important in 1947.

No forecasts were made after June 5th since the critical period when blight developed in 1938 and 1946 had passed and the mean temperature during the following week was above 75° F. The charts were continued, however, and furnished some interesting information about the two isolated outbreaks of late blight that occurred in June and July.

The trace of blight that occurred late in June developed between June 15th and 28th when the temperature was abnormally low and there was a fairly heavy rainfall of 1.2 inches. In this case blight occurred only in a few isolated fields where conditions were especially favorable because they were surrounded by high woods. The more serious outbreak in the last week of July developed during a period of low temperature from July 20th to the 26th which was immediately preceded by a heavy rainfall of 2.7 inches. Both of these outbreaks were checked quickly by the higher temperatures that followed. Although the charts do not give sufficient warning to prevent the isolated outbreaks of blight that may occur in the middle of the season, the records for the last 13 years indicate that weather conditions favoring such outbreaks rarely occur and do not last more than about a week.

The actual monetary value of the late blight forecasts is difficult to estimate since it is not known how many growers make use of them and the cost of spraying or dusting varies from one farm to another. Some idea of the potential value may be gained, however, by multiplying the number of acres of potatoes and tomatoes by the estimated cost of applying fungicides. If routine spraying or dusting were practiced, seven or eight applications would be necessary to keep the crop protected through the season and the cost would be between $30 and $40 an acre. Since over 60,000 acres were planted to potatoes and tomatoes in Virginia, the cost of spraying or dusting the two crops would have been approximately $2,000,000 in 1947. This amount of money would be well spent in a year such as 1946 when late blight was very destructive, but would have been wasted in a year like 1947 when the disease was unimportant. Also other leaf and foliage diseases were unimportant in 1947 so the use of fungicides would not have been justified for their control. The purpose of the forecasts is to elminate needless spraying or dusting in years when blight is not important and to insure prompt and adequate protective measures in years when it threatens to cause serious damage.

VIRGINIA TRUCK EXPERIMENT STATION, NORFOLK

PROGRESS REPORT ON LATE BLIGHT

Late blight (Phytophthora infestans) was observed on fall tomatoes in the Sanford area on the northern East Coast of FLORIDA October 16 and 18. Some plants showed severe leaf symptoms, and a few infected fruits were seen. Between the middle and the end of December the disease appeared in the Everglades and southern East Coast areas. Where growers follow recommended control programs it has not become a problem. However, it has been severe in gardens and fields where it is not controlled. Potatoes have been affected in both Everglades and East Coast areas but efficient treatment of the fields observed had confined infection to only occasional lesions.

Early in November the disease was found on fall potatoes on Wadmalaw Island about 20 miles southwest of Charleston, SOUTH CAROLINA. Later in the month it appeared on volunteer potato and tomato plants on the Truck Station farm eight miles west of Charleston. All volunteer plants were killed by frost December 1, but the disease had already spread to tomatoes in the Station greenhouse. However, use of copper dust and keeping the plants as dry as possible checked it.

Severely affected potato plants were observed in Terrebonne Parish, in southern LOUISIANA, on December 4. Weather conditions preceding the appearance of the disease were said to be ideal for its development. The source of infection could not be established.

FIRE BLIGHT OF BARTLETT PEARS IN STORAGE WENATCHEE, WASHINGTON, 1947

Theodore R. Wright

Introduction

Although fire blight (caused by Erwinia amylovora (Burrill) Com. S. A. B., 1923) is present every season in the pear orchards of the Wenatchee district, this year is the first in more than a quarter-century that the disease has reached serious proportions. In certain localities small amounts of blossom blight and spur blight have been found in the spring every year, but with the advent of hot and dry summer weather the organism has become inactive, the spread of lesions ceased, and new infections could no longer be found. The fruit crop has then attained its size and matured with very little reduction in leaf surface.

This year, however, while the disease repeated the pattern of past years at first, weather conditions did not force the organism to become

dormant as expected; blight of spurs and twigs and trunk cankers increased at an alarming rate, and a new problem of blight of nearly mature fruit arose. In numerous instances blighted fruits were found on trees having no observable sources of infection. Naturally, the effects in visibly and invisibly infected fruit in storage and in processing became a matter of concern particularly to handlers and processors. It was to obtain information on this problem that the investigation reported herein was designed.

Materials and Methods

To determine whether fruit in the vicinity of blighted fruit in the orchard might break down later in storage, 31 Bartlett pears hanging beneath visibly infected fruit and showing drops of ooze on their surface but no lesions were picked in an orchard in Wenatchee, August 5, 1947. This fruit was placed in storage at 65° F. and 80% relative humidity on the same day. Three days later 15 Bartlett pears were collected from beneath infected fruit in an orchard at Leavenworth. These pears were placed in 65° storage on the following day.

Four dozen apparently healthy fruit picked from a tree in an area of the Wenatchee orchard that showed no evidence of blight, the tree itself being blight-free, were used to determine the length of time between inoculation and lesion development. One half of the fruits were sprayed with a very heavy distilled-water suspension of the ooze from infected pears. Six of the fruits so inoculated and six that were not inoculated were placed immediately in storage at each of four temperatures, 30°, 35°, 40°, and 65° F., all maintained at high humidity (80-95 percent).

Many pear canners in recent years have found that a bath of 2 to 8 minutes duration in water at 90° F. before the fruits are placed in the ripening room is beneficial in securing more uniform ripening. The question of whether this bath might become contaminated from infected pears and cause infection and subsequent decay of healthy pears, was investigated. A bath was prepared by using a heavy suspension of the blight bacteria allowed to ooze from infected fruit that had been held for 10 days at 30°. Another bath was prepared at the same time and in the same manner from freshly collected fruit. Both baths were brought to temperature and one dozen non-infected fruits were simultaneously given a 10-minute treatment in each. Similar lots were treated 1, 2, 4, and 8 hours later in the same baths, the temperature being maintained at 90° throughout the period. One additional lot of pears was given a similar treatment in distilled water. In every case, after the treatment was completed, the fruit was placed in 65° storage at high humidity to simulate commercial practice.

It was observed in the orchards examined that in almost every instance in which a spur had produced 2 fruits and one of these had become in-

fected earlier in the season, judging from the considerably smaller size of the mummy, the other fruit had an incipient blight lesions on the side adjacent to the mummy, undoubtedly due to frequent contact of the two. To determine how much new infection could be caused by healthy fruit coming in contact with heavily diseased fruit while in storage, and what effect temperature might have on the rapidity of lesion formation, a diseased and a healthy fruit was placed in 30°, 35°, 40°, and 65° F. storage in such a way that contact between the two was maintained at all times.

Results

Fruit Exposed in the Orchard. Bartlett pears collected from beneath blighted fruit in the Wenatchee orchard and held at 65° F were ripe in 10 days. Thirteen percent of these showed 1 to 3 lesions of irregular outline, 8-20 mm. across, dark brown in color, sunken, and with a sharply defined periphery. Larger lesions overlay an area extending 5 mm. into the flesh of the fruit, containing corky strands medium brown in color. One of the more severely infected fruits had a sharp acid flavor; it is not known whether this was due to the presence of blight or not, for the other fruits having lesions were not impaired in flavor. The fruits from the Leavenworth orchard ripened in 12 days at 65° and were entirely free of infection. The flavor of these pears was normal.

Artificial Inoculation. In the instances in which healthy fruits were sprayed with a water suspension of the bacterial ooze, the lots placed at 65° F. ripened in 10 days, and remained entirely free of blight. Their flavor was unimpaired. The remaining lots in 30°, 35°, and 40° were held at those temperatures for 7 weeks, then ripened at 65°. In no case could any infection be found. Both lots held at 40° developed severe scald in the ripening room and those from 35°, storage core breakdown, but quality and flavor of the inoculated fruit and the checks that had been at 30° were unimpaired.

Inoculation in the Warm Water Bath. The disease likewise failed to develop on fruit given a warm water treatment (90° F.) in a suspension of the ooze from decaying fruit, whether fresh inoculum or that from storage at 30° for 10 days was used. This fruit ripened uniformly in 10 days at 65° to full dessert quality.

Infection by Contact. The disease can be infectious when decaying and healthy fruits are maintained in contact. At a temperature of 30° F., 6 weeks were required before a definite lesion was noticeable on the surface of the healthy fruit in contact with infected ones; at 35° and 40° about 5 weeks were required. When the pears were held at 65°, the centers of the lenticels in the area covered with ooze from the infected fruit became darkened in 2 days, but 7 days were necessary before any lenticel spots coalesced to form a definite lesion.

Discussion and Conclusions

It is apparent from the foregoing results that fire blight of pears is of little consequence once the fruit has left the trees. This does not mean that the disease is not of any importance from the grower's standpoint. On the contrary, blight, while insidious during seasons of ordinary weather in the Wenatchee district, can cause such extensive damage during weather favorable for its development that the crop may be reduced before maturity, or it may even necessitate removal of entire trees. From the handler's or processor's viewpoint, however, fire blight does not appear to be capable of causing extensive damage in storage or transit so long as large quantities of visibly diseased fruit are not included in the boxes.

Only 13 percent of the fruits that had been exposed to the disease in one orchard and none of those from the other orchard developed blight lesions when ripened. There was but one instance, and it uncertain, in which the presence of blight seemed to impair the flavor. It should be remembered that these fruits were selected as bearing evidence of exposure to blight; had they been boxed as part of a commercial picking, their presence would hardly have been noticed at the cannery.

Because blight lesions are conspicuous in the orchard and unpleasantly stickly to the touch, it is doubtful that pickers would care to handle such fruit. If, though, by some chance diseased fruit should be included in the lugs of healthy pears, there would be little likelihood of enough spread to cause economic loss. Fruit sprayed with ooze showed no infection at 30°, 35°, or 40° F. when stored for 7 weeks. Although infection of healthy pears was possible through contact, 6 weeks was required at 30°. While such a period is but half, or less, of the entire storage period to which Bartlett pears may be subjected, it is apparent that the organism is capable of only very slow progress in the host under such conditions; and although a few adjacent fruits might possibly become infected through such contact the prospect of economic loss appears remote. At higher temperatures of 35° and 40° and with contact, lesions developed in 5 weeks, but these temperatures allow core breakdown and scald to develop and hence are not used commercially. At 65° shallow lesions formed in 7 days, but contact was maintained during all of that period, whereas in commercial practice the diseased pear would have been removed in grading prior to being placed in the ripening room.

DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, SOILS AND AGRICULTURAL ENGINEERING, AGRICULTURAL RESEARCH ADMINISTRATION, UNITED STATES DEPARTMENT OF AGRICULTURE, WENATCHEE, WASHINGTON. October 2, 1947

BORDEAUX AS A CAUSE OF INJURY TO PEACH TREES IN OREGON

Adin P. Steenland

The spray program for peaches in Oregon includes a Bordeaux 8-4-100 spray to be applied as soon as each variety is picked, before the fall rains start. This spray is to control peach blight, caused by Coryneum beijerinckii [C. carpophilum] and dieback. Nursery stock is usually sprayed in September with the same fungicide.

During October and November of 1947 sprayed trees had dark-red to black lesions on the dark colored side of the new wood. These lesions varied in size from a pin point to one-fourth inch in diameter, and in number from a few per foot to complete coverage. The greater number of lesions occurred on trees that had been thoroughly sprayed with Bordeaux. No lesions of this type, and few of any type, were noted on unsprayed trees. Isolations were attempted from these lesions, and of 35 plantings 30 were sterile, Fusarium sp. was isolated from 3, and Alternaria sp. was isolated from 2.

Early in November a nurseryman sent in four peach twigs. Three of these twigs had lesions similar to those noted on the Bordeaux sprayed trees, and the other had no lesions. The three twigs with the lesions had been sprayed with Bordeaux in September, but the other was from a two-year-old tree that had not been sprayed.

On November 19 and 20 nine nurseries in the Willamette Valley were visited, and seedlings and two-year-old peach trees were inspected. Seedlings were inspected at five nurseries, two of which had sprayed with Bordeaux, two had not sprayed, and one had dusted with 90 percent sulfur 10 percent Fermate. Lesions were abundant on the Bordeaux sprayed seedlings, but no lesions were noted on the unsprayed or dusted seedlings. Two-year-old trees were inspected at nine nurseries. One nursery had trees sprayed with Bordeaux and unsprayed trees, two others had Bordeaux sprayed trees, and six others had unsprayed trees. Bordeaux sprayed trees all had typical lesions, whereas no lesions were noted on the unsprayed trees. Slappey, a variety favored by home canners in Oregon, seems to be especially susceptible to this injury.

The lesions are dark-red to black in color, and do not extend into the wood. The epidermis may be somewhat blistered and when it is removed a red-purple color is noted. Some lesions are tan in color. This is especially common on Slappey.

Isolations were attempted from 42 lesions found on seedlings and two-year-old trees. Thirty-five of the plants were sterile, Fusarium sp. was isolated from 5, and Alternaria sp. from 2 plantings. It is thought that these are secondary organisms.

On November 24 two-year-old peach trees from another nursery were inspected. They had typical lesions, and had been sprayed with Bordeaux in September.

On November 26 two-year-old trees from still another nursery were inspected. No lesions were noted, and these had not been sprayed.

Observations indicate that it would be desirable to test further the possible injurious effects of Bordeaux when applied as an early fall spray for peach blight. It is felt, however, that enough evidence has been gathered to justify a strong suspicion that this spray is causing more injury than good. Experiments are planned for 1948 to give a definite answer to this question. Lesions on two-year-old trees are being watched to see whether they are enlarging.

OREGON AGRICULTURAL EXPERIMENT STATION, CORVALLIS

ALFALFA AND CLOVER DISEASE SURVEY IN EASTERN VIRGINIA NOVEMBER, 1947

S. B. Fenne, C. L. Lefebvre, R. G. Henderson, H. M. Tysdal, and T. J. Smith

During the week of November 12, a disease survey was made of alfalfa and clover fields in the counties of Westmoreland, Richmond, James City, and Norfolk.

Stem rot (Sclerotinia trifoliorum) was known from spring surveys to occur rather generally in many sections in eastern Virginia. Apothecia in great abundance were observed in practically every alfalfa field visited in James City and Norfolk Counties. In one field near Norge in James City County, the fungus with immature sclerotia was seen growing on alfalfa shoots producing bleached areas several inches above the ground. It appeared that these lesions had arisen from ascospore infections which had taken place this fall. From the abundance of inoculum present, it might be predicted that stem rot may cause severe damage to alfalfa and clovers in these counties if favorable weather for its development occurs next spring.

Anthracnose (Colletotrichum trifolii) was found on alfalfa in Westmoreland and Norfolk Counties and on red clover in each of the counties visited. Severe injury to alfalfa had been observed previously, in several other parts of the State.

On alfalfa, black stem (Ascochyta imperfecta) was found in practically every field visited. Leaf spot caused by Stemphylium botryosum was

observed generally and had caused severe injury in one field seeded last August in Norfolk County.

Downy mildew (Peronospora trifoliorum) was observed rather generally distributed in all four counties.

Bacterial wilt (Corynebacterium insidiosum) was found in one field in Richmond County where much of the stand had been killed. This apparently is the first report of bacterial wilt in eastern Virginia.

In addition to the diseases mentioned above, the following fungi were isolated from specimens collected on this survey: On alfalfa: Pseudopeziza jonesii, Cercospora zebrina, Pleospora sp., and Rhizoctonia solani; on ladino clover: Curvularia trifolii; on red clover: Stemphylium sarcinaeforme; on crimson clover: Rhizoctonia solani, and Cercospora zebrina; on hairy vetch: Rhizoctonia solani.

VIRGINIA POLYTECHNIC INSTITUTE, AND DIVISION OF FORAGE CROPS AND DISEASES, U. S. BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

CANKER STAIN OF LONDON PLANE IN ST. LOUIS, MISSOURI

T. W. Bretz and C. M. Tucker

Canker stain of London plane (Platanus acerifolia Willd.), caused by a species of Endoconidiophora has been found in two rather widely separated locations in the City of St. Louis. The discovery of this deadly disease in a location remote from previously reported centers of infection[1] resulted from a letter received early in November, 1947, from Mr. E. R. Clmsted, City Forester, in which he informed the writers that planetrees were dying in such numbers as to cause considerable concern.

At one location, of a total of 51 trees within the confines of one city block 5 trees had died in 1947 and 16 were obviously diseased at the time of examination. Here there was evidence that trees had been removed in prior years. A resident of the street stated that planetrees began to die at this location two years ago, which suggests that the disease has been established in this neighborhood for some time. At the second location, in a row of 25 trees, 9 had died and 6 were diseased. Examination of the affected trees showed the development of extensive cankers on the tree trunks. In most instances, the cankered areas very nearly or completely encircled the trees and extended vertically a considerable distance from the apparent point of origin. At one location, all cankers appeared to have their origin at the base of the tree, as if initiated by some injury, possibly lawn-mower damage. At the other location, much carving and cutting on the trunks was evident and here many cankers appeared to have started at the point of such injuries. Cuts made into the wood of affected trees showed a type of staining similar to that ascribed to the canker stain disease of the London plane by Walter[1]. Microscopic examination of material collected from these trees showed the presence of fungus hyphae and spores, characteristic of the genus Endoconidiophora, in the tissues in great abundance. Isolations from such material have yielded a culture producing endoconidia of like character, as well as perithecia characteristic of the fungus Ceratostomella.

The presence of this disease presents a serious shade tree problem in St. Louis. The London planetree is very widely used in St. Louis for street planting and block after block of city streets are lined with specimens of this tree, to the exclusion of all other species. Fortunately measures have been devised for the effective control of the canker stain.[1] A city-wide program using these measures, in which all individuals doing tree work cooperate, should successfully control the

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[1] Walter, James, M. Canker stain of planetrees. U. S. Dept. Agr. Circ. 742, 12 pp. illus. 1946.

disease and possibly eradicate it from this area. It is not known how the fungus may have been introduced into St. Louis. However, the plantings now infected are subject to periodic pruning by commercial tree workers and it seems possible that the causal organism may well have been brought to the locality on contaminated pruning tools or tree working equipment from some distant city.

DIVISION OF FOREST PATHOLOGY, U. S. BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING, and AGRICULTURAL EXPERIMENT STATION, UNIVERSITY OF MISSOURI

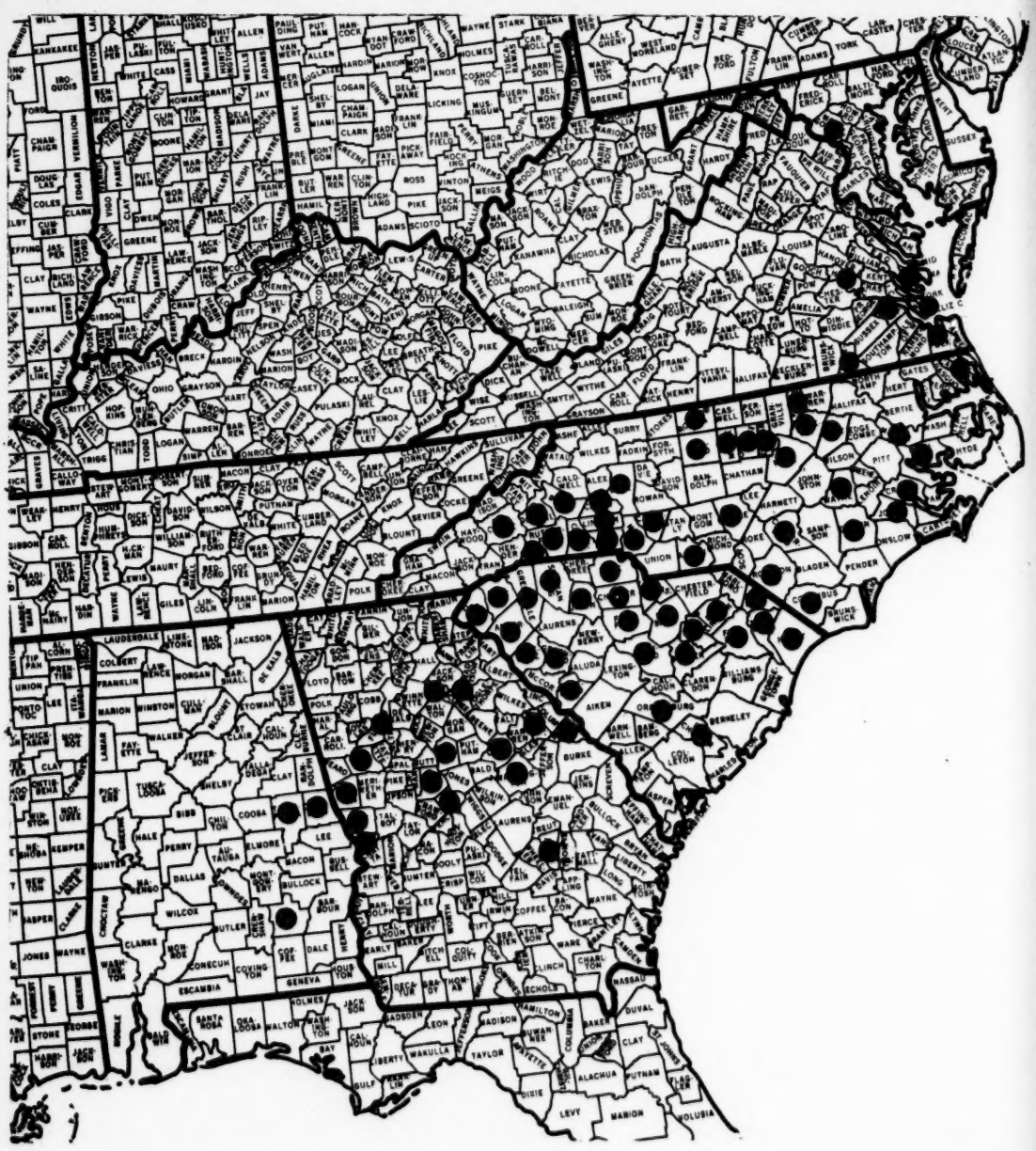

Figure 1.--Map showing known range of mimosa wilt, by counties, in 1947. If the wilt has been reported in a county, a dot appears within the county boundary lines.

DISTRIBUTION OF MIMOSA WILT IN 1947[1]

E. Richard Toole

The vascular wilt of the mimosa tree (Albizzia julibrissin), caused by Fusarium oxysporum f. perniciosum, has been found in many additional locations since the previous reports by Toole in 1941[2] and Hepting in 1946[3]. Hepting reported this disease in 40 counties in 4 States in 1946. Figure 1 shows the known range of mimosa wilt, by counties, in 1947. The wilt is known to occur in 82 counties in 6 States. Of particular interest are the most northerly report, made by May,[4] and the extension southwest into Alabama.

DIVISION OF FOREST PATHOLOGY, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

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[1] Acknowledgement is made to G. G. Rohwer and other personnel of the white-fringed beetle control project of the Bureau of Entomology and Plant Quarantine, for the many wilt samples submitted.

[2] Toole, E. Richard. Further distribution of the mimosa wilt. Plant Disease Reporter 25: 317. 1941.

[3] Hepting, George H. Mimosa wilt--a new scourge to southern trees. Sun-Up 1(7): 12, 27. 1946.

[4] May, Curtis. Mimosa wilt found near Washington, D. C. Plant Disease Reporter 31: 326. 1947.

SOME OBSERVATIONS ON MINT DISEASES IN 1947

E. C. Stevenson

Information on mint diseases in the United States was collected in the field during July and August 1947. The principal mint-growing areas were inspected; namely, northern Indiana, southern Michigan, south-central and western Washington and western Oregon.

Indiana growers have been noting spots in their fields for several seasons where plants are stunted, bronze-colored and often killed. These symptoms are associated with Verticillium wilt and the general tendency, therefore, has been to call the disease wilt. Many such spots were examined by the writer and it seems that in addition to the possibility that they are caused by wilt, they may come from unbalanced fertility, root rotting or crown rotting organisms, or a combination of these. Additional studies are needed to determine the nature of the disorder.

Several fields, near Bremen, Indiana, that have been in mint continuously for the past 25 to 30 years were examined. Production in these fields has been low because of weeds, poor cultural practices and disease. Anthracnose, caused by Sphaceloma menthae, is prevalent in these old stands and causes much damage. This disease was a definite threat to the mint industry in Indiana a few years ago but since it can be controlled easily by clean plowing in the fall, progressive growers are no longer troubled with it.

Rust, caused by Puccinia menthae, attacked spearmint in Indiana in late July 1947. Growers were forced to cut early because the mint was too advanced for operating dusting equipment at that time. According to a report from one grower, the spearmint was practically defoliated in fields where cutting was delayed after the rust became widespread. If rust appears late in the season in another year, it would be well for growers to investigate the use of airplane dusters.

Verticillium wilt was very serious in Michigan again in 1947. Peppermint production in the St. John's area, at one time an important peppermint growing section, has been declining rapidly because of wilt. A few growers there still produce peppermint but they are forced to cut early and the oil yields are low. Spearmint is somewhat more tolerant to wilt than is peppermint and many growers in the St. John's area have resorted to producing spearmint. Some of the spearmint fields, however, were rather severely damaged by Verticillium wilt in 1947 and growers were forced to cut early to save their crops.

Peppermint production in Washington and Oregon is relatively recent compared with the Mid-west. Most of the western oil is produced under irrigation. In the Yakima Valley they use furrow irrigation; in western

Washington and in the Willamette and McKenzie River Valleys of Oregon sprinkler irrigation is used, and in the lower Columbia River district, around Clatskanie and Rainier, Oregon, the fields are subirrigated.

Diseases of mint have received very little attention in the far West, mainly because none have been found that are very serious. An unidentified crown rot was recorded in the Pasco-Kennewick section. The most outstanding symptom noted was a slimy, spittle-like exudate in and around the crown of affected plants. The cortex of affected crowns was rotted and sloughed off readily and the slimy nature of the affected portions appeared to indicate bacterial action. The disease did not seem to be widespread in the area but approximately 2 percent of one field near Kennewick was affected and Dr. J. D. Menzies of the Irrigation Branch Experiment Station at Prosser, Washington, reported that 10 percent of a field near Prosser was also infested.

The whole western mint-producing area was searched for evidence of Verticillium wilt. The only place that typical wilt symptoms could be found was on a farm near Gervais, Oregon. Wilting was severe and it seems almost certain that the Verticillium organism was responsible.

The virtual absence of Verticillium wilt in the western plantings is somewhat perplexing. The original planting stock for that area came from the Mid-west where wilt has been present for many years. It hardly seems conceivable that wilt-infested planting material was not included in some of the shipments, and the infection in the planting near Gervais, Oregon, supports this contention. The only outstanding difference between the cultural practices of the Mid-west and the West is that some form of irrigation is used on practically all western plantings and perhaps control of the water supply through irrigation has something to do with the scarcity of wilt.

Some western growers have grown mint continuously on the same land since the crop was introduced there about 40 years ago. Progressive growers fertilize heavily but generally do not practice crop rotation. It is very possible that diseases and insects will become increasingly important under this system of continuous cropping and it appears advisable to watch the area so that outbreaks of disease and insects will be detected in their early stages.

DIVISION OF TOBACCO, MEDICINAL AND SPECIAL CROPS, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING, AGRICULTURAL RESEARCH ADMINISTRATION, UNITED STATES DEPARTMENT OF AGRICULTURE.

ENTOMA

The Plant Disease Survey would like to announce that ENTOMA, a directory of insect and plant pest control, has again arrived on the "newsstands" of the scientific world. This directory, now in its seventh edition, 1947, was compiled by the Editorial Committee of the Eastern Branch of the American Association of Economic Entomologists. The foreword to this seventh edition of ENTOMA states that:

"ENTOMA is designed to aid manufacturers, entomologists, plant pathologists, county agents, and others interested in insect and plant pest control in obtaining certain kinds of information which is often quite difficult of access. Advertisements are included which furnish special information not given in these listings. The committee recommends that the advertisements, as well as other parts of the directory, be studied so as to obtain the greatest benefit from it."

A brief introductory statement points out trends in the development of insecticides and fungicides and outlines fundamental facts about their composition, selection and use. There is also a discussion of spreaders, penetrants, adhesives, emulsifiers, solvents, blending agents, and diluents. The rest of the text is devoted to various lists that make the volume a source book of where to get information as well as materials and equipment. For instance, there are lists of fungicides and insecticides and their manufacturers; of societies, dealers and officials of interest for entomologists and plant pathologists; of manufacturers and suppliers of machinery and equipment; books and films on pest control; and other lists on pertinent subjects.

Fungicides are indexed in two comprehensive lists. The first, an alphabetical list of insecticides and fungicides and the materials used in them -- "Acids" to "Zinc Sulphate" -- with the manufacturers and distributors of each, takes up about half the text and is probably the most generally useful part of the volume. Trade marked insecticides, fungicides and adjuncts with the manufacturers are given in a second list.

In bringing together in one place so much related information the Committee has undertaken a laborious piece of work and completed it in a manner that deserves appreciation and support from everyone interested in the manufacture, testing, and use of insecticides and fungicides.

From the physical standpoint this publication of 473 6" x 9" pages is printed on heavily coated white glossy paper, which apparently is very durable for thumbing, with an attractively styled cover.

Dr. George S. Langford is Chairman of the Editorial Committee and correspondence relative to ENTOMA should be directed to him at the Department of Entomology, University of Maryland, College Park, Maryland. The price of this very useful index is $1.00, plus 20 cents for mailing.

CHECK LIST REVISION

Freeman Weiss

CAMPANULA (CAMPANULACEAE)

CAMPANULA spp., as C. AMERICANA L., AMERICAN BELLFLOWER, (1), C. CARPATICA Jacq., TUSSOCK B. (2), C. PERSICIFOLIA L., WILLOW B. (3), and C. PETIOLATA A.DC. (C. rotundifolia of Amer. auths.), HAREBELL (4); other spp. (5). Biennial or perennial herbs, (2) and (3) of Europe, cultivated for ornament; (1) and (4) endemic in the U.S., sometimes grown in wild gardens.

Aecidium campanulastri G.W.Wils. (0, I), rust. Iowa, Minn. (1).
Botrytis cinerea Pers. ex Fr., gray-mold blight. Alaska (5).
Cercoseptoria minuta J.J. Davis, leaf spot. Wis. (5)
Coleosporium campanulae (Pers.) Lév. (II,III), rust. N. Y. to Miss., Mo., and Wis. (1); Calif. (3); Conn. to Ky. and Wis. (5), frequently on C. rapunculoides L. 0 and I on Pinus resinosa and P. rigida
Erysiphe cichoracearum DC., powdery mildew. Pa. (5)
Fusarium sp., root rot. N. J. (1), N. Y. (5)
Mycosphaerella campanulae (Ell. & Kell.) Jacz., on stems. Ohio (1).
Phlyctaena campanulae Clem., on stems. Colo. (4).
Phoma ? gentianae Kuehn, on stems. Tex. (4)
Phyllosticta alliariifoliae Allesch., leaf spot. N. J., N. Y. (5)
Puccinia campanulae Carm. (III), rust. Mont., N. Y. (4); Calif., Ore., Wash. (5)
Ramularia macrospora Fres., leaf spot. Alaska (5)
Rhizoctonia solani Kuehn, root rot. Ill. (5)
Sclerotinia sclerotiorum (Lib.) DBy., stem rot. Md. (3)
Sclerotium rolfsii Sacc., southern blight. Ill. (2,3,5)
Septoria campanulae (Lév.) Sacc., leaf spot. Ill., Iowa, Kans., Miss., Mo. (1); Wis. (1,5)

CAMPANULA MEDIUM L., CANTERBURY BELLS. Biennial of Europe, cultivated for ornament.

Heterodera marioni (Cornu) Goodey, root knot. Md.
Rhizoctonia solani Kuehn, root and stem rot. Conn., Tex.
Sclerotinia sclerotiorum (Lib.) DBy., stem rot. Wash.
Sclerotium rolfsii Sacc., southern blight. Ill., N. J.

Yellows -- virus (Chlorogenus callistephi Holmes, Callistephus virus 1 K.M.Sm.). Pa.

PLATYCODON (CAMPANULACEAE)

PLATYCODON GRANDIFLORUM A.DC., BALLOON-FLOWER. European hardy perennial cultivated for ornament.

Colletotrichum sp., on stems. Conn.
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.
Phytophthora sp. (? P. cactorum (Leb. & Cohn) Schroet.), blight. Minn.
Rhizoctonia solani Kuehn, root and stem rot. Conn., Pa.

SPECULARIA (CAMPANULACEAE)

SPECULARIA spp., VENUS LOOKING-GLASS. S. BIFLORA (R. & P.) Fisch. & Mey. (1), S. LEPTOCARPA (Nutt.) A.Gray (2), and S. PERFOLIATA (L.) A.DC. (3), other spp. (4). Annual herbs of plains and dry woodlands; (1) mostly southern, (2) western, (3) widely distributed; sometimes grown in wild gardens

Cercospora specularise Ell. & Langl., leaf spot. La. (4)
Coleosporium campanulae (Pers.) Lév. (II,III), rust. N. Car., Pa. (3)
Cuscuta sp., dodder. Tex. (3)
Phymatotrichum specularise Berk. & Curt., root rot. Tex. (1)
Septoria specularise Berk. & Curt., leaf spot. Va. (1); Kans. (2); Pa. to Ala., Tex., and Wis. (3); Ill., La., Tex. (4)
S. specularina Sacc. S. Car. (?)
Synchytrium sp., leaf gall. Tex. (3)
Ustilago specularise Stevenson, seed smut. Okla. (3)

CANNA (CANNACEAE)

CANNA EDULIS Ker-Gawl, EDIBLE CANNA (1), C. FLACCIDA Salisb. (2), and C. INDICA L., INDIAN SHOT (3). Tuberous or rhizomatous perennial herbs of tropical America, (2) and (3) also in the southern U. S.; grown for edible tubers (1), or for ornament (3); wildlife food plant (2).

Actinomyces sp., on rootstocks. Del.
Heterodera marioni (Cornu) Goodey, root knot. Hawaii (1).
Macrophoma subconica Ell. & Ev., on stems. La. (? 3)
Myrmaecium cannae Dearn. & Barth., on leaves. P. R. (3)
Phoma sp., on stems. Ala. (3)
Physalospora obtusa (Schw.) Cke., on stems. Ala.
Puccinia cannae (Wint.) P.Henn. (II,III), rust. Fla. (1,2,3); P. R., Canal Zone (1,3,spp.). 0 and I unknown
Rotylenchus similis (Cobb) Filip., root nematode. Hawaii (1)

Mosaic -- unidentified virus. Hawaii, P. R. (1)

CANNA GENERALIS Bailey, GARDEN CANNA. Cultigen derived from C. iridiflora Ruiz. & Pav., C. warscewiczii Dietr., C. flaccida, and others; grown for ornamental foliage and flowers.

Alternaria sp., leaf spot (? secondary). Mich., S. Car., Tex.
Fusarium sp., rhizome rot. Minn., Mo., Pa.
Pseudomonas cannae (Bryan) Stapp, bacterial bud rot. Colo., Conn., Ill., Md., Miss., Nebr., N. J., N. Car., Ohio, Okla.
Puccinia cannae (Wint.) P. Henn. (II,III), rust. Fla., Ohio, Tex., P. R.
Sclerotium rolfsii Sacc., southern blight. Tex.

Mosaic -- unidentified virus. Md., P. R.

CLEOME (CAPPARIDACEAE)

CLEOME spp., SPIDER-FLOWER. C. LUTEA Hook. (1), and C. SERRULATA Pursh (2). Annual herbs of prairies and plains in the Central and Western States, (2) occasionally eastward. C. SPINOSA L. (3), of tropical America, is cultivated for ornament and occasionally escaped in the East and South. Other spp. (4). All are useful honey plants.

Cercospora cleomis Ell. & Halst., leaf spot. Mich. (2); N. J. (3)
C. conspicua Earle. Okla. (1,2), P. R. (3,4)
Heterodera marioni (Cornu) Goodey, root knot, Hawaii (4)
Heterosporium hybridum Ell. & Ev., leaf spot. Iowa, Mont. (2)
Puccinia aristidae Tracy (0,I), rust. Ariz. (1); Ariz., Colo., Ind., Mont., Nebr., N. Mex. (2); Ind. (3); Colo., Del. (4). II and III on Aristida and Distichlis spp.

ABELIA (CAPRIFOLIACEAE)*

ABELIA GRANDIFLORA (André) Rehd., GLOSSY ABELIA (1). Flowering shrub derived from A. chinensis x A. uniflora, half-evergreen, Hardiness Zone V. A. CHINENSIS R.Br. (2), deciduous shrub of e. China, Hardiness Zone VII.

Heterodera marioni (Cornu) Goodey, root knot. Calif., Miss. (1)
Oidium sp., powdery mildew. Tex. (1)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1,2)
Pythium sp., rootlet rot. Tex. (1)
Rhizoctonia solani Kuehn, root rot. Tex. (1)

Chlorosis -- soil alkalinity. Tex. (1)

* For other genera of this family not listed here, such as Lonicera, Sambucus, Symphoricarpos, and Viburnum, see PDR. vols. 25 and 26

LINNAEA (CAPRIFOLIACEAE)

LINNAEA BOREALIS L. var. AMERICANA (Forbes) Rehder, TWINFLOWER. Trailing evergreen herb of northern woodlands and mountain summits; used in rock gardens and a wildlife food plant.

Godronia linnaeae Karst., on stems. Me.
Halbaniella linnaeae Dearn., black mildew. N. Y.
Phyllachora wittrockii (Eriks.) Sacc., tar spot. Mich., Mont., N. H., N. Y., Alaska
Septoria breviuscula Sacc., leaf spot. N. Y.
Venturia dickiei (Berk. & Br.) Ces. & De Not., leaf spot. Ida., Mich., Mont., N. Mex., N. Y., Ore., Wash., Wis.

TRIOSTEUM (CAPRIFOLIACEAE)

TRIOSTEUM spp., HORSE-GENTIAN. T. ANGUSTIFOLIUM L. (1), T. AURANTIACUM Bicknell (2), and T. PERFOLIATUM L. (3). Perennial herbs of woodlands in the Northeastern and Central States, and southward; (2) and sometimes (3) grown in wild gardens; wildlife food plants.

Aecidium triostei Arth. (0,I), rust. Mo. (1)
Cladosporium triostei Pk., leaf spot. Ill., Iowa, Mo., Nebr., W. Va., Wis. (2,3)
Cylindrosporium triostei Kell. & Swing., leaf spot. Kans., Wis. (2,3); Ill. (3)
Gnomonia triostei (Deam. & House) Dearn., on stems. N. Y. (3)
Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich. (3)

AGROSTEMMA (CARYOPHYLLACEAE)

AGROSTEMMA GITHAGO L., CORN-COCKLE. Annual herb of Europe, diffusely naturalized in the U. S. and a weed in grain fields; wildlife food plant and sometimes grown for ornament.

Fusarium sp. (? F. culmorum (W.G.Sm.) Sacc.), stem rot. Ind.
Gloeosporium sp., leaf spot. Ind.
Marssonina delastrei (DeLac.) Magn., leaf spot. Ill., Ind., Mich., Miss., Mo.
Septoria lychnidis Desm. var. pusilla Trail, leaf spot. N. Dak.

ARENARIA (CARYOPHYLLACEAE)

ARENARIA spp., SANDWORT, especially A. CONGESTA Nutt. (1), A. FENDLERI A.Gray (2), A. GROENLANDICA (Retz.) Spreng. (3), A.

ARENARIA cont.--

PEPLOIDES L. (4), A. SAJANENSIS Willd. (5), A. STRICTA Michx. (6), other spp. (7). Low, mostly perennial herbs (those listed), others annual, of sandy or rocky habitats, mostly northern or alpine. Several are grown in rock gardens (3,5,6); a few are minor forage plants (1, 2, 4); some are weeds.

Erysiphe polygoni DC., powdery mildew. Calif. (6)
Hendersonia tenella Schroet., leaf spot. Tex. (7)
Mycosphaerella stellarinearum (Rabh.) Johans., on leaves. Colo. (5)
M. tingens (Niessl) Larsen, on leaves. N. Mex. (2)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (7)
Puccinia arenariae (Schum.) Wint. (III), rust. Mont. (1); N. Y., Wis. (6); Calif., Fla., Tex. (7)
P. tardissima Garrett (II,III), rust. Colo., Utah, Wyo. (1); N. Mex. (2); Colo., Ore., Tex., Utah, Wyo. (7).
Pyrenophora comata (Niessl) Sacc., on stems. Alaska (7)
P. phaeospora (Duby) Sacc., on stems. Wyo. (5)
Septoria sp., on leaves. N. J. (7)
S. ammodeniae Dearn., on leaves. Alaska (4)
Uromyces silenes (Schlecht.) Fckl. (0,I,II,III), rust. Colo., Utah (7)
Ustilago violacea (Pers.) Fckl., anther smut. Me., N. H., N. Y., Vt. (3); Tex. (7).

CERASTIUM (CARYOPHYLLACEAE)

CERASTIUM spp., MOUSE-EAR CHICKWEED, especially C. ALPINUM L. (1), C. ARVENSE L. (2) and its varieties, C. NUTANS Raf. (3), C. VISCOSUM L. (4), C. VULGATUM L. (5), other spp. (6). Low perennial (1,2,5) or annual (3,4) herbs, endemic or widely naturalized in the U. S.; mostly weeds, but some are grown in rock gardens, some furnish food for wildlife.

Isariopsis albo-rosella (Desm.) Sacc., leaf spot. Wis. (3); Mass., Wis. (4); Miss., N. H., N. Y., Pa., Wis. (5)
Melampsorella cerastii (Pers.) Schroet. (II,III), rust. Me. (1); Colo., Mont., N. Mex., S. Dak., Utah, Wash., Wyo., Alaska (2, 6); Nebr., Ore. (5). 0 and I on Abies and Picea spp.
Peronospora alsinearum Casp., downy mildew. Colo. (2); Ill., Iowa, Md., Wis. (3); Ala., Iowa Miss., N. Car. (4,5). Several segregates from this sp. have been reported as P. conferta (Unger) Gäum. in Alaska (5); P. septentrionalis Gäum. in Arctic N. America; P. atlantica Gäum. in Colo. (2).
Pseudopeziza cerastiorum (Wallr.) Fckl., leaf spot. Ore. (2)
Puccinia arenariae (Schum.) Wint. (III), rust. Colo., Mont. (6)
Rhizoctonia solani Kuehn, root and stem rot, brown patch. Me. to Md., Ill. and Minn. (5)

CERASTIUM cont.

Septoria cerastii Rob. & Desm., leaf spot. Ala., Ky., Miss. (2); Ala., Ill., Ind., Ky., Miss., Mo., N. J. (4,5); Ida., Wis. (6)
Sorosporium saponariae Rudolphi, flower smut. Colo., N. Y. (2)
Synchytrium sp., leaf gall. Tex. (2); S. cerastii M.T.Cook, La. (4); S. stellariae Fckl., Mo. (5), Calif. (6)
Ustilago violacea (Pers.) Fckl., anther smut. Alaska (6)

DIANTHUS (CARYOPHYLLACEAE)

DIANTHUS ARMERIA L., GRASS PINK (1); D. BARBATUS L., SWEET WILLIAM (2); D. CHINENSIS L., RAINBOW P. (3); D. DELTOIDES L., MAIDEN P. (4); D. PLUMARIUS L., COTTAGE P. (5). Hardy perennial herbs (2,3,4,5) of Europe and Asia, grown for ornament and sometimes naturalized (especially 2 and 4). Cultivated garden pinks are derived mostly from (3) and (5); (1) is an annual weed.

Alternaria dianthi F.L.Stevens & Hall, blight, stem rot. Widespread in Northeastern and Central States, also Calif., Colo., Tex., P. R. (5, ? 3)
Ascochyta dianthi (Alb. & Schw. ex Fr.) Lib., leaf spot. N. Y. (1), Miss. (5)
Asteroma dianthi Cke. & Harkn., on stems and leaves. Calif. (5)
Botrytis cinerea Pers. ex Fr., gray mold. Alaska (3,5)
Ditylenchus dipsaci (Kuehn) Filip., leaf and stem nematode. Ore. (2)
Fusarium oxysporum Schlecht. f. barbati Snyder, wilt. Calif., Kans. (2). Fusarium sp., causing wilt, reported in Mass., N. J., S. Car., and Va. may be this.
F. poae (Pk.) Wr., bud rot. N. Y. (? 5)
Heterodera marioni (Cornu) Goodey, root knot. ? Fla. (2,3,5), Miss. (5)
Heterosporium echinulatum (Berk.) Cke., leaf spot. Calif., N. Y., Ore. (? 5)
Mycosphaerella sp. (Sphaerella caryophyllea Cke. & Harkn.), on stems. Calif. (sp.)
Phoma sp. (? P. dianthi Bub.) on stems. Va. (2), La. (5)
Phyllosticta sp. (? Ascochyta dianthi), leaf spot. Wash. (2)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (? 5)
Puccinia arenariae (Schum.) Wint. (III), rust. Ala., Conn., Mass., Miss., N. Y., Pa. (2); N. Y. (4)
Pythium ultimum Trow, root rot. ? Calif. (2,5)
Rhizoctonia solani Kuehn, stem rot. Conn., Ill., Kans., Mass., Miss., N. J., N. Y., Pa. (2,3,5)
Sclerotium rolfsii Sacc., southern blight. Conn., Fla., N. Car. (2); Ill., Tex. (5)
Septoria dianthi Desm., leaf spot. Ala., Mich., N. Y. (2); Miss., N. J., N. Y., N. Car. (5); N. Y. (3)

DIANTHUS cont.

Uromyces caryophyllinus (Schrank) Wint. (II, III), rust. Iowa (2); Nebr. (2,3); Ill., Miss., N. Y., Tenn., Tex., Wash. (spp.). O and I on Euphorbia, not reported in U. S. See note under D. caryophyllus.

Ustilago violacea (Pers.) Fckl., anther smut. N. J.

? Volutella dianthi Atk., anthracnose. Del., Ind., N. Y. (2). See note under D. caryophyllus

Curly top -- virus (Chloroğenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Calif. (2, 5), Tex. (2)

Yellows -- virus (Chlorogenus callistephi var. californicus Holmes, Callistephus virus 1A K.M.Sm.). Calif. (2)

DIANTHUS CARYOPHYLLUS L., CARNATION. Perennial of southern Europe and Asia, commonly grown under glass for cut flowers. Hardy garden types derived from this and D. plumarius also exist; these records mostly applicable to the greenhouse varieties.

Agrobacterium tumefaciens (E.F.Sm. & Town.) Conn, crowngall, witches'-broom. Md.

Alternaria dianthi F.L.Stevens & Hall, blight, collar and branch rot. General.

Botrytis cinerea Pers. ex Fr., gray mold of buds and flowers. Cosmopolitan under damp conditions.

Cladosporium herbarum Lk. ex Fr., leaf mold (probably secondary). Cosmopolitan. Var. nodosum causing (?) scab reported in Ca.

Colletotrichum sp. (? C. dematium (Fr.) Grove), on stems, anthracnose. N. J., N. Y., Tex. Reported without specific name in N. J.; subsequently referred to Volutella dianthi but is better left here. Vermicularia herbarum West., reported in Tex., may also be this.

Corticium stevensii Burt. See Pellicularia koleroga

Corynebacterium fascians (Tilford) Dowson, fasciation, witches'-broom. Ohio

Fusarium spp., root rot, dry stem rot, branch rot. General. The following spp. have been shown to cause diseaes of this type but specific identification is frequently lacking in reports: F. avenaceum (Fr.) Sacc., F. culmorum (W.G.Sm.) Sacc., F. scirpi Lambotte & Fautr. and var. acuminatum (Ell. & Ev.) Wr. (all = F. roseum Lk. emend. Snyder & Hansen). The following spp. also may be associated with these diseases but are held to be nonparasitic: F. heterosporum Nees and F. semitectum Berk. & Rav. (= F. roseum sensu Snyder & Hansen), and F. tricinctum (Cda.) Sacc.

F. oxysporum Schlecht. f. dianthi (Prill. & Del.) Snyder & Hansen, wilt (perhaps also stem rot). Calif., Colo., Mass., Mich., Nebr., N. Y., Wash.; probably general

F. poae (Pk.) Wr. (= F. tricinctum f. poae (Pk.) Snyder & Hansen),

DIANTHUS cont.

bud rot. Mass. to Va., Kans., and Nebr.; Wash.

Heterodera marioni (Cornu) Goodey, root knot. General in the South, ** occasional in greenhouses in the North.

Heterosporium echinulatum (Berk.) Cke., leaf mold, "fairy ring." Occasional throughout range of greenhouse culture, also Calif. An ascigerous stage, Didymellina dianthi C.C.Burt, has been reported in England, not found here.

Macrosporium nobile Vize. Reported in Md. and Mich.; probably a Stemphylium but identity uncertain.

Mycosphaerella caryophylli (Pass.) Cruchet, on stems. Alaska.

Oidium sp., powdery mildew. Fla., N. Car.

Pellicularia filamentosa (Pat.) Rogers. See Rhizoctonia solani

P. koleroga Cke., web blight. N. Car.

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.

Pseudomonas caryophylli Burkh., bacterial wilt. Ill., Ind., Iowa, Mo., Wash.

P. woodsii (E.F.Sm.) Stapp, bacterial spot. Mass. to Ga., Ind., and Mich.; also N. Dak., Okla., Ore., Wash.

Pythium sp., root rot. Ill. P. ultimum Trow, Calif., Wis. P. vexans DBy., Calif.

Rhizoctonia solani Kuehn, root rot, wet stem rot. General in greenhouse and outdoor culture.

Sclerotium rolfsii Sacc., southern blight. Fla., Miss., Tex.

Septoria dianthi Desm., leaf spot. Vt. to S. Car., Miss., Ohio and Mich.; Calif.

(Sporotrichum anthophilum Pk.): Fusarium poae

Uromyces caryophyllinus (Schrank) Wint. (II,III), rust. General. O and I on Euphorbia in Europe, not known here. Under International Rules of Nomenclature this name should be U. dianthi (Pers.) Niessl.

Ustilago violacea (Pers.) Fckl. Reported in N. America, doubtfully or without locality in U. S.

Vermicularia herbarum West. See Colletotrichum

Verticillium dahliae Kleb. (? V. albo-atrum Reinke & Berth.), wilt. N. J.

Volutella spp., on stems, ? anthracnose. Mich., N. J., N. Y., Ore., Pa. V. dianthi Atk., reported in N. J., was not formally described but, as illustrated, was a Colletotrichum. V. leucotricha Atk., reported in N. Y., is a Volutella but was not associated with anthracnose.

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Calif., Tex.

Mosaic -- virus. Specific reports from Colo., Ill., Ind., Iowa, N. J., N. Y., Okla., Wash., Wis., with indications that it is general in commercial stocks.

Streak -- virus. Specific reports from Colo., Ill., Iowa, N. J., N. Y., Wash., Wis.; probably general in commercial culture but

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**Heteropatella valtellinensis (Trav.) Wr., leaf rot. Wash.

DIANTHUS CARYOPHYLLUS cont.

less frequent than mosaic; in such stocks it occurs together with mosaic virus.

Yellows -- name applied to the complex virosis caused by the mosaic and streak viruses together, equivalent to streak as it occurs in commercial carnations; has also been applied to diseases attributed to Fusarium spp.

Potassium deficiency (yellow or necrotic spotting). N. J., N. Y.

GYPSOPHILA (CARYOPHYLLACEAE)

GYPSOPHILA PANICULATA L., BABY'S-BREATH (1). Hardy perennial of Europe and Asia, grown for ornament in gardens and locally escaped throughout the U. S. Several other spp. (2) also are cultivated; G. ELEGANS Bieb., an annual, under glass for cut flowers.

Bacterium gypsophilae N.A.Brown, root gall. N. J. (1,2)
Botrytis cinerea (Pers. ex Fr.), blight. N. J. (1)
Corynebacterium fascians (Tilford) Dowson, fasciation. Ohio
Heterodera marioni (Cornu) Goodey, root knot. Fla. (2)
Pythium debaryanum Hesse, damping off. Conn. (1)
Rhizoctonia solani Kuehn, damping off, root rot. Conn. (1), Ill. (2)

Yellows -- virus (Chlorogenus callistephi Holmes, Callistephus virus 1 K.M.Sm.). N. J. (1). Also C. callistephi var. californicus Holmes in Calif. (1)

LYCHNIS (CARYOPHYLLACEAE)

LYCHNIS spp., especially L. ALBA Mill., EVENING CAMPION (1); L. CHALCEDONICA L., MALTESE CROSS (2); L. CORONARIA (L.) Desr., MULLEIN-PINK (3); L. DIOICA L., RED CAMPION (4); other spp. (5). Mostly biennial or perennial herbs of Europe and Asia, grown for ornament and frequently escaped in the Eastern and Central States.

Alternaria ? dianthi F.L.Stevens & Hall, leaf spot. Alaska (2)
Botrytis cinerea Pers. ex Fr., shoot and flower blight. Alaska (2)
Corticium galactinum (Fr.) Burt, root rot. Md. (1)
Heterosporium sp. (? H. echinulatum (Berk.) Cke.), leaf mold. Alaska (2,5)
Leptothyrium lychnidis Berk. & Cke., leaf spot. Ala. (5).
Phyllosticta lychnidis (Fr.) Ell. & Ev., leaf spot. (Tex. (1); Iowa (3)

LYCHNIS cont.

Phyllosticta punctiformis (Desm.) Allesch. N. Y. (5)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1)
Pleospora herbarum (Pers. ex Fr.) Wallr., on stems. Md. (3)
P. vulgaris Niessl. Alaska (5)
Puccinia arenariae (Schum.) Wint. (III), rust. Pa. (2)
Rhizoctonia solani Kuehn, root and stem rot. Ill. (2,5)
Sclerotium rolfsii Sacc., southern blight. Tex. (1)
Septoria ? lychnidis Desm., leaf spot. Mass. (5)
S. melandrii Pass. Wis. (1)
Uromyces suksdorfii Diet. & Holw. (I,II,III), rust. Utah (on L. drummondii S. Wats.)
U. verruculosus Schroet. (II,III), rust. Ind., Mich., Tex. (1); N. Y. (1, 4)
Ustilago violacea (Pers.) Fckl., anther smut. Minn., Wis., Wyo. (5)

SAGINA (CARYOPHYLLACEAE)

SAGINA PROCUMBENS L., PEARLWORT. Matlike perennial herb of Europe, naturalized in the Northeast; a weed in fine turf.

Rhizoctonia solani Kuehn, brown patch. Mass. to Mich.

SAPONARIA (CARYOPHYLLACEAE)

SAPONARIA OFFICINALIS L., SOAPWORT (1). Perennial herb of Europe, grown in old gardens and widely escaped in the Eastern and Central States. S. VACCARIA L. (2), a European annual grown for ornament and widely escaped, is a wildlife food plant.

Alternaria saponariae (Pk.) Neerg., leaf and stem spot. Conn. to Md., Ind., and Minn. (1)
Colletotrichum sp. (? C. dematium (Fr.) Grove), on stems. N. Y. (1)
Cylindrosporium officinale Ell. & Ev., leaf spot. Ind. (1)
Didymella sp., on leaves. Ga. (1)
Phyllosticta tenerrima Ell. & Ev., leaf spot. N. J. (1)
Puccinia aristidae Tracy (0,I), rust. Colo. (2)
Rhabdospora saponariae Bres. & Sacc. N. Y. (1)
Septoria noctiflorae Ell. & Kell., leaf spot. Ill. (1)

SILENE (CARYOPHYLLACEAE)

SILENE spp., CATCHFLY, especially S. ACAULIS L., CUSHION-PINK (1); S. ANTIRRHINA L. (2), S. GALLICA L. (3), S. NOCTIFLORA L. (4), S.

SILENE cont.

STELLATA (L.) Ait., STARRY CAMPION (5); other spp. (6). Perennial (1,5), or annual (2,3,4) herbs, of prairies and open woodlands; many endemic especially in the Western States, several adventive from Europe; grown for ornament (1,5, and others), wildlife food plants (1,2,3), or weeds (2,4)

Ascochyta silenes Ell. & Ev., leaf spot. Mont., Okla., Wis. (2)
Colletotrichum sp., on stems. Md. (6)
Heterodera marioni (Cornu) Goodey, root knot. Hawaii (3)
Leptosphaeria silenes (De Not.) Rostr., on leaves. Alaska (1)
Marssonina delastrei (DeLac.) Sacc., leaf spot. Wis. (5)
Peronospora silenes G.W.Wils., downy mildew. Kans., Nebr., Tex., Wis. (2); Ill., Tex. (6)
Phyllosticta nebulosa Sacc. (P.pallida Halst.), leaf spot. Mont., N. Y., Wis. (4)
P. silenes Pk. N. Y., Tex. (2)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (2,6)
Pleospora sp. (? P. herbarum (Pers. ex Fr.) Wallr.), on stems. Calif., Nev. (6)
Puccinia aristidae Tracy (0,I), rust. Ariz., Tex. (2)
Rhizoctonia solani Kuehn, damping off. Ill. (6)
Septoria dimera Sacc., leaf spot. Nebr. (2), Wis. (2,6).
Septoria spp., perhaps all referable to S. silenes West., but variously reported as follows:
S. noctiflorae Ell. & Kell. Ind., Tex. (2); Kans., N. J., Tex. (4); Wis. (4,6)
S. silenes West. Kans., Okla (2); Ill. (6)
S. silenicola Sacc. Nebr. (2,4,5); N. Y. (4); Iowa, Md., Pa., Wis. (5); Ida., Mont., Utah (6)
Sorosporium saponariae Rudolphi, flower smut. Colo., Nev., Utah (6)
Uromyces silenes (Schlecht.) Fckl. (0,I,II,III), rust. Pa. (4); Calif., Iowa, Kans., Mont., Wash. (6)
U. suksdorfii Diet. & Holw. (I,II,III), rust. Calif., Ida., N. Mex., Utah, Wash. (6)
Ustilago violacea (Pers.) Fckl., anther smut. N. H. (1); Calif., Mont., Tex., Va., Wash., Wyo. (6). Var. major Clinton (= U. clintoniana Cif.) is reported on S. watsoni in Wash.

SPERGULA (CARYOPHYLLACEAE)

SPERGULA ARVENSIS L., SPURRY. Small annual herb of Europe, widely naturalized in waste ground and a weed in cultivated fields, a wildlife food plant.

Albugo lepigoni (DBy.) O. Kuntze, white rust. Tex.

SPERGULA cont.

Heterodera marioni (Cornu) Goodey, root knot. ? S. Car.
Peronospora obovata Bon., downy mildew. Me., Wis., Alaska
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.
Puccinia arenariae (Schum.) Wint. (III), rust. Me., N. Y., Pa., Tex.

SPERGULARIA (CARYOPHYLLACEAE)

SPERGULARIA spp., SAND SPURRY. Annual or biennial herbs of salt marshes and sandy waste ground; wildlife food plants.

Albugo lepigoni (DBy.) O. Kuntze, white rust. Calif., Mass.
Puccinia aristidae Tracy (0,I), rust. Calif. II and III on Distichlis spp.
Uromyces acuminatus Arth. var. spartinae (Farl.) Arth. (0,I), rust. Calif. II and III on Spartina spp.

STELLARIA (CARYOPHYLLACEAE)

STELLARIA spp., especially S. BOREALIS Bigel. (1) and S. LONGIPES Goldie (2), STARWORT; S. MEDIA (L.) Cyr., COMMON CHICKWEED (3); other spp. (4). Mostly low annual herbs of moist ground; (1) and (2) endemic in the Northern and Central States, (3) adventive from Europe and cosmopolitan weed; some spp. are wildlife food plants. S. GRAMINEA L. (5), a European perennial naturalized in the Northeast, may be grown for ground cover.

Heterodera marioni (Cornu) Goodey, root knot. Md. (3)
Iseriopsis albo-rosella (Desm.) Sacc., leaf spot. Wis. (4)
Ligniera junci (Schwartz) M.R.I.Cook, in roots. Calif. (3)
Melampsorella cerastii (Pers.) Schroet. (II,III), rust. Calif., Mont., N. Y., Ore., Utah, Wash. (1); Calif., Alaska (2); Me., N. H., Wash. (3); Calif., Ida., Mich., N. Y., Pa., Wash., Alaska (4).
Mycosphaerella stellarinearum (Rabh.) Johans., on leaves. Alaska
Peronospora alsinearum Casp., downy mildew. N. Car. (3); Va. (4)
Puccinia arenariae (Schum.) Wint. (III), rust. Calif., Mont., Wash. (1); Alaska (2); Mont., Wyo. (4)
P. aristidae Tracy (0, I), rust. Colo. (3). II and III on Distichlis spp.
Rhizoctonia solani Kuehn, brown patch. Me. to Md. and Mich. (5)
Rhizomyxa hypogeae Borzi, in roots. Calif. Probably in part = Ligniera junci
Sclerotinia sclerotiorum (Lib.) DBy., stem rot. Calif., S. Car. (3)
Septoria jamesii Pam., leaf spot. Colo. (4).
S. stellariae Rob. & Desm. Md., Mich., N. Y., Ore. (3); Wis. (3,4)

STELLARIA cont.

Sorosporium saponariae Rudolphi, flower smut. Colo., Utah (4)
Synchytrium chiltoni M.T.Cook, leaf gall. La. (3)
S. stellariae Fckl. La., Miss., Okla., Tex. (3)
Ustilago alsineae Clinton & Zundel, seed smut. Ida., Wash. (4)

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Calif.
Yellows -- virus (Chlorogenus callistephi var. californicus Holmes, Callistephus virus 1A K.M.Sm.). Calif.

CROCANTHEMUM (CISTACEAE)

CROCANTHEMUM CANADENSE (L.) Britton, FROSTWORT. Woody perennial herb of the Eastern and North Central States, grown in rock gardens and a wildlife food plant.

Cylindrosporium eminens J.J.Davis, leaf spot. Wis.

HELIANTHEMUM (CISTACEAE)

HELIANTHEMUM NUMMULARIUM (L.) Mill., SUNROSE. Evergreen woody herb of Mediterranean region, grown in rock gardens and for ground cover

Septoria chamaecisti Vest., leaf spot. Wash.

HUDSONIA (CISTACEAE)

HUDSONIA TOMENTOSA Nutt., BEACH-HEATHER. Low evergreen shrub of the Northeastern and North Central States, sometimes grown for ground cover on seashores.

Gnomonia conradii (Ell.) Wehm., on stems. N. J.

COMMELINA (COMMELINACEAE)

COMMELINA NUDIFLORA L., CREEPING DAYFLOWER (1); C. VIRGINICA L., VIRGINIA D. (2); other spp. (3). Perennial herbs, usually in moist ground, in the Eastern and Central States and south through tropical America; sometimes weeds in cultivated fields, some furnish food for wildlife.

Colletotrichum commelinae Ell. & Ev., leaf spot. Fla., Tex. (3)
Heterodera marioni (Cornu) Goodey, root knot. Hawaii (1), Fla. (3)

COMMELINA cont.

Illosporium commelinae F.L.Stevens, leaf spot. P.R. (2,3)
Mycosphaerella tetraspora Seaver, leaf spot. Tex., P. R. (3)
Omphalia flavida Maubl. & Rangel, on leaves. P. R. (1)
Phakopsora commelinae Gäum. (II,III), rust. Guam (1)
P. tecta Jacks. & Holw. (II,III). P. R. (2,3)
Phyllosticta commelinicola E.Young, leaf spot. Okla., Tex., P. R. (1)
Puccinia commelinae Holw. (II,III), rust. Tex. (3). O and I unknown.
Pythium arrhenomanes Drechs., root rot. Hawaii (1)
Uromyces commelinae (Speg.) Cke. (II,III), rust. P. R. (2); Fla., Tex., Virgin Is. (3). O and I unknown.

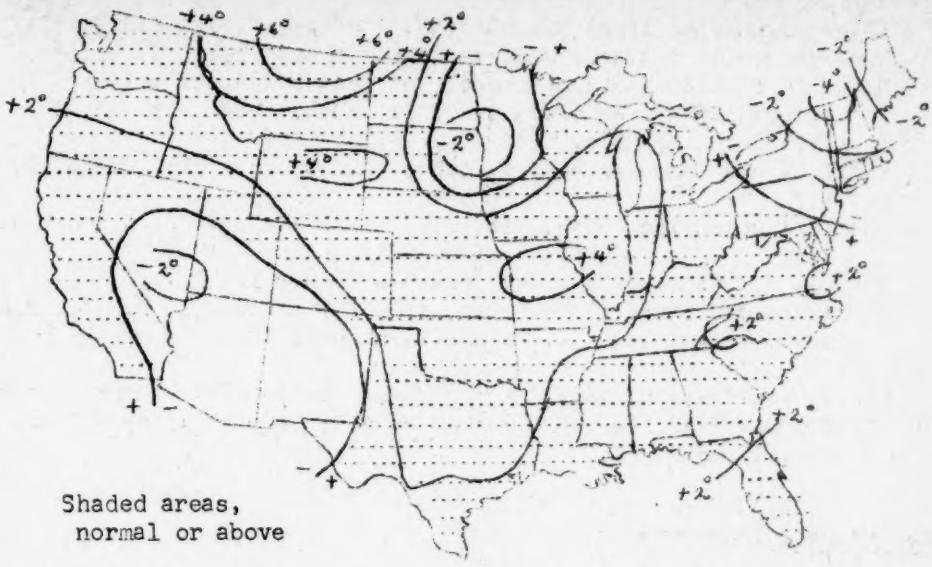
Mosaic -- virus. In part Marmor cucumeris Holmes, Cucumis virus 1 K.M.Sm., reported in Fla. and Hawaii; in part unidentified, Hawaii and P. R.

TRADESCANTIA (COMMELINACEAE)

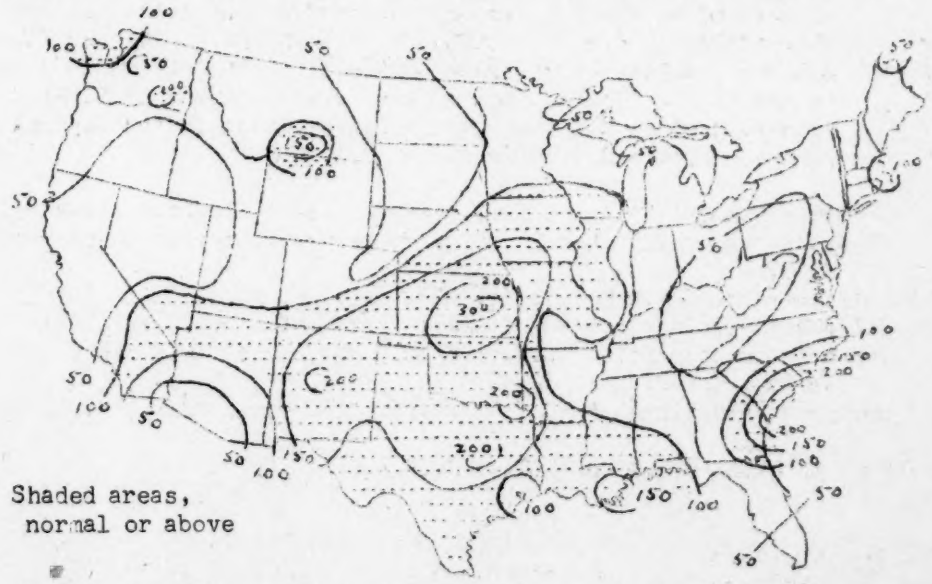
TRADESCANTIA FLUMINENSIS Vell., WANDERING JEW (1); prostrate perennial herb of S. America, grown indoors for ornamental foliage and naturalized in the far South. T. VIRGINIANA L. (2) and other spp. (3), SPIDERWORT; erect perennial herbs, (2) in woodlands in the Middle Atlantic and Central States, often cultivated for ornament; other spp. usually on sandy plains in the Central and Plains States and southward.

Botrytis cinerea Pers. ex Fr., gray-mold leaf blight. Alaska (1)
Cladochytrium replicatum Karling, on leaves (? weakly parasitic). N. Y. (1)
Colletotrichum sp., leaf spot. Tex. (1); N. J. (2)
Heterodera marioni (Cornu) Goodey, root knot. Ore., Tex. (1)
Septoria tradescantiae (Ell. & Kell.) J.J.Davis, leaf spot. Wis. to Tex. and S. Dak. (2,3)
Uromyces commelinae (Speg.) Cke. (II,III), rust. Tex., P. R. (3)

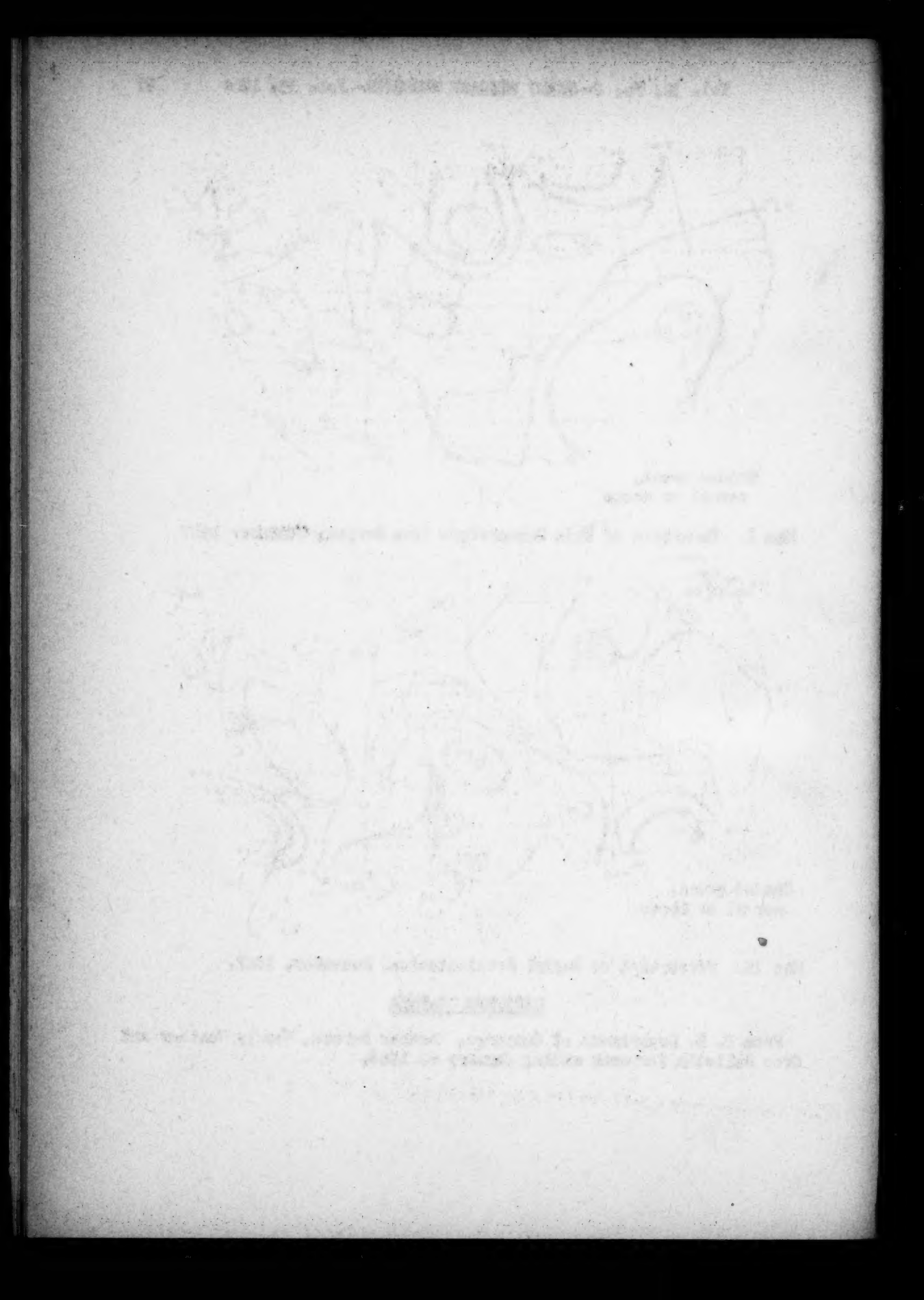
DIVISION OF MYCOLOGY AND DISEASE SURVEY



Map I. Departure of Mean Temperature from Normal, December 1947



Map II. Percentage of Normal Precipitation, December, 1947.

DECEMBER WEATHER

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